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Analysis of Pasar Rakyat Micro Enterprises using Business Intelligent and Data Mining in Jakarta During the Covid-19 Pandemic

Hendra Achmadi

hendra.achmadi@uph.edu

Faculty of Economics and Business, Universitas Pelita Harapan, Tangerang, Indonesia

Abstract. This study aims to determine the segmentation of the seller at Pasar Jatinegara, and from the data the micro entrepreneur at Pasar Jatinegara mostly is fashion garmen and also home appliances and the rest is a food and bererage, and sales total for a month 55% is below five hundreds rupiahs and 39 % is from range five hundreds until one million a day, and its conclude the Micro Entrepreneurship and most of the seler from the interview has been there for more than 10 years, so these seller is a lower income trap, because they cannot increase skill to increase the revenue or income. As we thought that Indonesia has Go-pay and OVO and Dana, but the reality the seller haven't have account bank, and never have loan at Bank and do not have a social media, and mostly communicate with sms and most of the seller 32 % is woman dan 68 % is man by using The Business Intelligent. In order to be clear about the segmentation among these seller, then Data mining with machine learning can do that and by using the machine learning with clustering method on the respondent's profile using k-means, in within cluster sum of squares by cluster is 76 %, and it can be seen that the respondent's profile which will increase the intention to use mobile payment is that the total sales are at most under 500 thousand, then the most education in clusters 1 and 3 is at the level of SMA is about 63 percent and the rest are elementary school graduates, and the network that is most widely used is Indosat and the number of suppliers is 1-3 and the number of customers is between 2-10 customers and the last gender is mostly male.

Keywords: Business Intelligent; Data mining; Clustering; K-mean

1. Introduction

Micro businesses Indonesia reach 12 million market traders in Indonesia according to data from the DPP of the Indonesian Market Traders Association. According to BPS data, market traders in Indonesia in 2019 there were 15,567 traditional markets in Indonesia with a total of 2,818,216 market traders. During the pandemic, 43 percent of market traders in Indonesia during the pandemic were closed because it was quiet. Therefore, the role of market traders and micro-enterprises in Indonesia is very large for the Indonesian economy. INAMIKRO is a non profit organization, that has objective to help a small and micro to have more awareness to digital business.

Micro, Small and Medium Enterprises (MSMEs), including traditional markets, have a very crucial role for the Indonesian economy. Of the approximately 64.2 million existing MSMEs, it is recorded that MSMEs contribute to Indonesia's GDP of more than 60%. (Anggraini, 2021). The Covid-19 pandemic also has an impact on MSMEs, especially market traders, where the government is making efforts to prevent the spread of Covid-19 by imposing PPKM (Enforcement of Community Activity Restrictions) which prevents people from crowding in one particular location, and for that the market is a place where this happens. buying and selling transactions, and the COVID-19 pandemic conditions, the government urges no cash exchange, in order to reduce the spread of covid-19. Therefore we need payment technology that can be done online. In order to change the habit of making transactions using cash, INAMIKRO has software that will help market traders to make transactions online, and also make payments online.

The problem that was caught by INAMIKRO from market traders was how to change the habits of these market traders in using technology-based applications, for that information technology literacy is needed to ensure that market traders can use payment technology and also borrow online. According to INAMIKRO, the needs of market traders for access to technology are at the time of buying and selling transactions and also access to capital. The ability to use computers will also increase work productivity, as researched by (Agus Tri Indah K, 2017).

Objective of the Research

The objective of this research is make an Descriptive analytics using descriptive statistics. In order to know the characteristics and the description of the small and micro bisnis in Pasar Jatinegara. So if the characteristics from the member of the Pasar Jatinegara and their acceptance of digital payment or digital marketing and mobile payment.

2. Literature Review

2.1 Data Mining Method

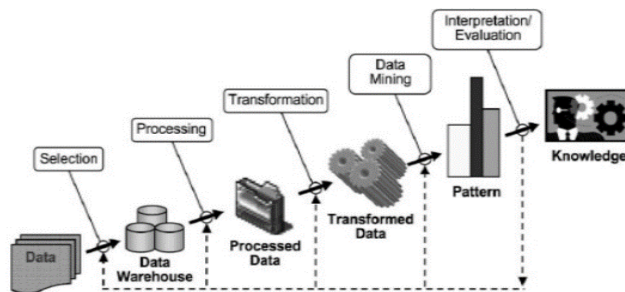
According to (Fatmawati, 2018) data mining is a process of finding useful new correlations, patterns or trends by mining a large number of data repositories, using pattern recognition such as statistics, and mathematical techniques, and the results of data mining can be divided into four groups. namely prediction models, clustering, association, estimation, classification.

2.1.1 Data Mining Processing Steps

According to (Fatmawati, 2018) said that the stages of the data mining process are starting from data selection from data sources to target data which are often referred to as datasets that are used as the basis for data processing, then the process is continued with data processing or data cleansing, here the data preparation begins for further processing, for example whether the data has number type or factor or date, and then the data in the data cleansing is also done by removing special characters, then after that the transformation is carried out, namely transforming the data from the cleansing data into the target data, the process then is to do data mining or data model based on a method that is suitable for the data, and the last is the process of interpreting the knowledge obtained from processing the data. And the data mining process stages can be seen in Figure 1. Data mining process steps.

Figure 1

Datamining process steps



2.1.2 k-Means and Clustering

According to (Fatmawati, 2018) clustering is the process of grouping data into several clusters or groups that have maximum similarity, data between clusters has minimal similarity.

According to Ledolter, J. (2013) observations on n units, (x_1, x_2, \dots, x_n) , with the observation on unit i representing a p -dimensional vector of features (attributes). The k -means clustering method partitions the n units into $k \leq n$ distinct clusters, $S = \{S_1, S_2, \dots, S_k\}$, so as to minimize the within-cluster sum of squares

$$\arg \min_s \sum_{j=1}^k \sum_{x_i \in s_j} \|x_i - m_j\|^2$$

3. Research Methodology and Result

This study uses two methods, the first is to use the Data Mining Method with a clustering algorithm to be able to group the respondent's profile. The second is a quantitative research method aimed at testing whether enthusiasm, anxiety has an effect on expertise in using computers and has an impact on intention to use technology. The data collected is 178 respondents who will be asked to market traders, where the data collection is using the google form. And the sampling technique is confinient sampling.

3.1 Business Intelligence

According to Sanjiv Jaggia (2021) Business analytics (data analytics) or Business Intelligent is involves extracting information and knowledge from data.

Table 1

Place of Business

Place To Business	Total
KP SUKAPURA	2
KP. MELAYU	1
Pasar Jatinegara	174
Sukapura Rw.002	1
Grand Total	178

From Table 1, The Place of Business mostly from Pasar Jatinegara Jakarta, 97% from all respondent from there.

Table 2

Types of Business

Types of Business	Total
Fashion	35
Alat-Alat Rumah Tangga (Ember, Plastik dll)	24
Makanan siap saji	17
Ikan Hias	11
Sembako	9
Buah buahan	3
kacamata	3
Kosmetik	3
Minuman	3
Pakan Hewan	3
Warmindo	3
Alat listrik	2
Buah buahan	2
Daging dan Ikan	2
Frozen Food	2
Gordeng	2
Kurma	2
Payung	2
Sendal	2
Sepatu	2
Warkop	2
aquarium	2
Alas Kaki	1
Alat tulis kantor	1
Atk	1
Bakso	1

From Table 2, the place of business mostly fashion and home appliance from Pasar Jatinegara Jakarta, 42 % from all respondent from there.

Table 3*Total Sales*

Total Sales	Total
1 juta–2 juta	5
2 juta–5 juta	4
500 ribu–1 juta	70
Di bawah 500 ribu	99

From Table 3, Total Sales of Business mostly under Five Thousand Rupiahs or 55% per day and 39% between five thousand rupiahs per day until one million rupiahs per day

Table 4*Total Sales and Types of Business*

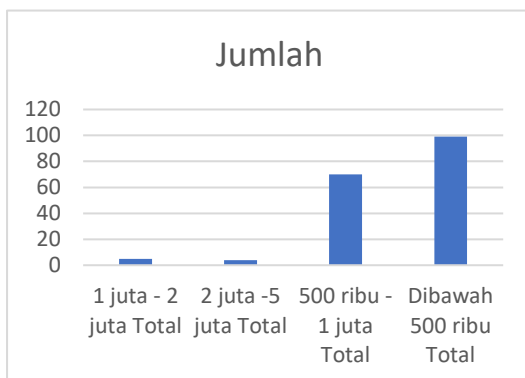
Total Sales	Types of Business	Total
1 juta - 2 juta	aquarium	1
	Fashion	3
	kacamata	1
1 juta - 2 juta Total		5
2 juta -5 juta	Alat tulis kantor	1
	Alat-Alat Rumah Tangga (Ember, Plastik dll)	1
	material bangunan	1
	Sate keroncong	1
2 juta -5 juta Total		4
500 ribu - 1 juta	Alat listrik	2
	Alat-Alat Rumah Tangga (Ember, Plastik dll)	9
	bengkel	1
	Besi	1
	Buah buahan	1
	catering	1
	Coffee Shop	1
	Daging dan Ikan	2
	Fashion	18
	Frozen Food	1
	Gordeng	1
	gordeng (perlengkaoan rumah)	1
	Ikan Hias	1
	Ikan hias, pakan, aquarium	1
	Jas Hujan	1
	jasa laundry baju	1
	kacamata	1
	Kandang Hewan	1
	Kolang Kaling	1
	Kosmetik	2
Kurma	2	
Makanan siap saji	4	
Minuman	1	

	Optik	1
	Pakan Hewan	2
	Pakan ikan	1
	Perlengkapan Rumah Tangga (Gorgyn)	1
	Sembako	6
	Sepatu	1
	service pompa	1
	sparepart	1
	Warmindo	1
500 ribu - 1 juta Total		70
Dibawah 500 ribu	Air galon isi ulang	1
	Alas Kaki	1
	Alat-Alat Rumah Tangga (Ember, Plastik dll)	14
	Aquarium	1
	Atk	1
	Bakso	1
	Buah	1
	Buah buahan	2
	Buah buahan	2
	Bumbu-Bumbu	1
	Fashion	14
	Frozen Food	1
	Gordeng	1
	Gorgyn	1
	Ikan Hias	10
	jumini	1
	kacamata	1
	Kedai makanan	1
	Kedai Minuman	1
	Kelapa Ijo	1
	Kosmetik	1
	kue	1
	Makanan	1
	Makanan & Minuman	1
	Makanan siap saji	13
	Minuman	2
	Pakan Hewan	1
	Pakan Ternak	1
	Payung	2
	Pisau, dll	1
	Sabun	1
	sate	1
	Sayur Mayur	1
	Sembako	3
	Sendal	2
	Sendal & Sepatu	1

	Sepatu	1
	Servis pompa	1
	Skincare	1
	Toko Buku	1
	Underwear	1
	Warkop	2
	Warmindo	2
	Total	99

Range Penjualan	Jumlah
1 juta–2 juta Total	5
2 juta–5 juta Total	4
500 ribu–1 juta Total	70
Di bawah 500 ribu Total	99

Figure 1
Range of total Sales per day



From Table 4 and figure 1, Total Sales of Business mostly and also the types of business that has revenue bellow under Five Thousand Rupiahs or 55% per day and 39 % between five thousand rupiahs per day until one million rupiahs per day. So there are the most of business at pasar Jatinegara are a micro business.

Table 5
Social Media

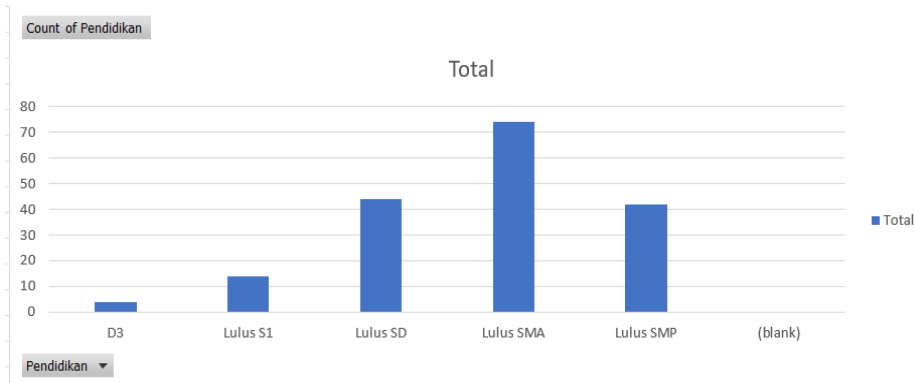
Social Media	Total
Facebook	1
Instagram	1
No	2
SMS	23
WA	151

From Table 5 Social Media that they use mostly SMS.

Table 6
Education

Education	Total
D3	4
Lulus S1	14

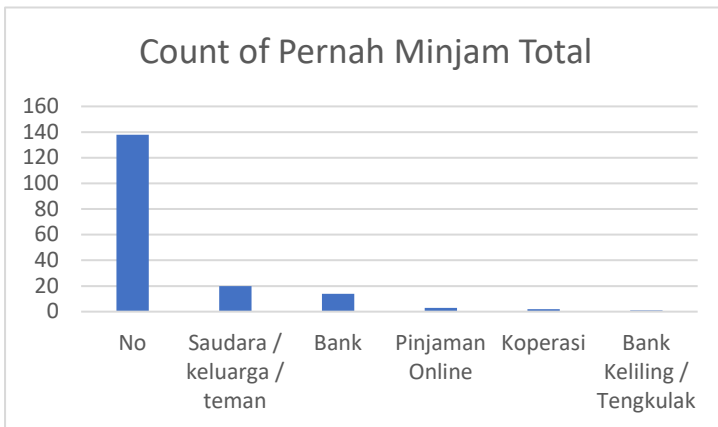
Lulus SD	44
Lulus SMA	74
Lulus SMP	42



From Table 6 Education mostly is 41% is high school and 24 % from elementary school and 23 % from junior high school

Table 7
Have Borrowed

Have Borrowed	Total
No	138
Saudara / keluarga / teman	20
Bank	14
Pinjaman Online	3
Koperasi	2
Bank Keliling / Tengkulak	1



From Table 7 most of them never borrow and is only 11 % had borrowed form family and 7,8 % had borrowed from Bank.

Table 8
Gender

Count of JK			Wanita		
JK	Um	Total			
Pria	21	1		20	1
	24	1		22	1
	26	1		24	2
	27	1		25	1
	28	3		29	2
	30	2		30	1
	31	1		31	1
	32	5		34	1
	33	3		35	1
	34	4		36	3
	35	3		38	2
	36	4		39	2
	37	6		40	1
	38	5		41	1
	39	3		42	1
	40	3		43	4
	41	3		44	2
	42	3		45	3
	43	3		46	2
	44	7		47	2
	45	4		48	1
	47	3		49	2
	48	3		50	4
	49	2		51	3
	50	5		52	4
	51	2		54	2
	52	3		60	2
	53	2		62	2
	54	1		63	1
	55	5	Wanita Total	64	2
	56	6	(blank) (blank)	69	1
57	2	(blank) Total			
58	2	Grand Total		178	
60	2				
61	3				
62	1				
63	4				
64	2				
65	3				
66	1				
67	1				
71	1				
Pria Total		120			

From Table 8 most of the seller 32 % is woman dan 68 % is man.

4. Discussion

4.1 Businesss Intelligence

From Table 1 to 8 , from the data the micro entrepreneur at Pasar Jatinegara mostly is fashion garmen and also home appliances and the rest is a food and bererage, and sales total for a month 55% is below five hundreds rupiahs and 39 % is from range five hundreds until one million a day, and its conclude the Micro Entrepreneurship and most of the seler from the interview has been there for more than 10 years, so these seller

is a lower income trap, because they cannot increase skill to increase the revenue or income. As we thought that Indonesia has Go-pay and OVO and Dana, but the reality the seller haven't have account bank, and never have loan at Bank and do not have a social media, and mostly communicate with sms and most of the seller 32 % is woman dan 68 % is man. In order to be clear about the segmentation among these seller, this research using Data mining to make clustering for customer segmentation and also the characteristics of these segmentation.

4.2 Data Mining Process

According to (Achmadi et al., 2022)Of the 23 variables from the initial question from the respondent's profile, coding is carried out first as in for each choices that it is not number, Its will converts all alphabet into numeric number , dan it call it a coding process.

After that, multiple regression is carried out to be able to assess what data has an effect on the Intention to use mobile payment and the regression results are obtained, and only the positive coefficients will be selected without seeing significant or not so that more comprehensive characteristics can be obtained, then there are 7 data that will be collected. used for clustering, namely education, number of suppliers, gender, total sales, network and ever borrowed, and the number of customers such as Table 3 Multiple Regression, to be parameters for making clusters using the k-means method with R Squared is 0.395259739.

Table 9
Multiple Regression and R Square

	<i>Coefficients</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	1.635953232	5.691482	5.40905E-08
Pendidikan	0.342579333	5.650773	6.60522E-08
Jml Sup	0.306119388	5.580847	9.28985E-08
JK	0.204478726	1.462609	0.145420667
Tot Penj	0.094011357	0.892093	0.373603816
Jaringan	0.027494558	0.758793	0.449026988
Pernah Minjam	0.027295046	0.879901	0.380155001
Jum_Pel	0.00592322	0.608369	0.543754579
R Square	0.395259739		

After that, only using the R Studio program in conducting the clustering method with k-means, so that after clustering, 3 large groups of respondents will be obtained, namely cluster 1, cluster 2 and cluster 3. After processing, the data is obtained as below and Within cluster sum of squares by cluster is 76 %, using R Studio.

```
library(ggplot2)
library(cluster)
library(factoextra)
```

```
R.Version()
```

```
univ<-read.csv2(file.choose())
univ
## first, clustering on just Red and White meat (p=2) and k=3
## clusters
numberik<-univ[3:6]
View(numberik)
dataclus<-na.omit(numberik)
```

```
datafix<-scale(dataclus)
head(datafix)
```

```
fviz_nbclust(datafix,kmeans,method='wss') ##K=2
fviz_nbclust(datafix,kmeans,method='silhouette')## K=2
```

```
set.seed(9999)
gap_stat<-clusGap(datafix,FUN=kmeans, nstart=25, K.max=10, B=180)
fviz_gap_stat(gap_stat)
```

```
final<-kmeans(datafix,3,nstart=25)
print(final)
```

Clustering vector:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14
2 2 2 2 2 2 2 1 1 2 3 2 2 2
15 16 17 18 19 20 21 22 23 24 25 26 27 28
3 3 3 2 3 1 2 2 2 2 2 3 3 3
29 30 31 32 33 34 35 36 37 38 39 40 41 42
3 3 3 2 2 2 2 3 3 1 2 3 1 2
43 44 45 46 47 48 49 50 51 52 53 54 55 56
1 2 3 3 3 3 2 2 2 3 2 3 3 1
57 58 59 60 61 62 63 64 65 66 67 68 69 70
1 3 2 2 3 3 1 2 3 2 2 3 2 3
71 72 73 74 75 76 77 78 79 80 81 82 83 84
2 2 2 3 3 3 2 2 1 3 2 3 1 3
85 86 87 88 89 90 91 92 93 94 95 96 97 98
2 3 2 3 3 2 3 2 3 2 3 2 3 1
99 100 101 102 103 104 105 106 107 108 109 110 111 112
1 2 1 3 1 3 2 2 2 2 2 1 3 2
113 114 115 116 117 118 119 120 121 122 123 124 125 126
2 2 3 2 2 2 2 2 2 1 2 2 3 3
127 128 129 130 131 132 133 134 135 136 137 138 139 140
2 1 1 2 2 1 3 2 2 2 2 2 2 1
141 142 143 144 145 146 147 148 149 150 151 152 153 154
2 2 1 2 3 2 2 1 3 2 2 2 2 2
155 156 157 158 159 160 161 162 163 164 165 166 167 168
2 3 2 2 1 1 1 3 1 1 2 2 3 3
169 170 171 172 173 174 175 176 177 178
2 2 1 1 2 3 1 3 3 1
```

Within cluster sum of squares by cluster:

```
[1] 22.88889 35.80583 33.06061
(between_SS / total_SS = 76.0 %)
```

Table 4
Clustering of Respondents

Cluster	Kode	Tot_penj	Pendidikan	Jaringan	Jml_Sup	Jum_Pel	Pernah Minjam	JK
Cluster 1	1	46	8	24	5	0	55	44
Cluster 1	2	28	16	11	24	2	0	35
Cluster 1	3	4	44	3	10	17	2	
Cluster 1	4	1	3	35	0	9	1	
Cluster 1	5		8	6	0	42	0	
Cluster 1	6			0			15	
Cluster 1	7			2			5	
Cluster 1	8			1			0	
Cluster 2	1	42	33	21	6		66	60
Cluster 2	2	31	19	6	21	8	1	13
Cluster 2	3		19	1	3		3	
Cluster 2	4			31				
Cluster 2	5			9				
Cluster 2	6			1				
Cluster 2	7			2				
Cluster 2	8			2				
Cluster 3	1	10	2	8	0		14	15
Cluster 3	2	10	7	1	5		0	9
Cluster 3	3	1	10	0	6		1	
Cluster 3	4	3	1	11	4			
Cluster 3	5		4	2	1		2	
Cluster 3	6			0			2	
Cluster 3	7			1			5	
Cluster 3	8			1			1	
Cluster 3	10					21		
Cluster 3	15					1		
Cluster 3	20					1		

From the results of table 4 Clustering of Respondents, we get results that give a similar pattern between cluster 1, cluster 2 and cluster 3, namely, firstly, the total sales at most are under 500 thousand, then the most education in clusters 1 and 3 is at SMA level is around 63 percent and the rest are elementary school graduates, and the network that is most widely used is Indosat and the number of suppliers is 1-3 and the number of customers is between 2-10 customers and the last gender is mostly male.

5. Conclusion and Suggestion

From the results of machine learning by using clustering on the respondent's profile using k-means, in within cluster sum of squares by cluster is 76 %, it can be seen that the respondent's profile which will increase the intention to use mobile payment is that the total sales are at most under 500 thousand, then the most education in clusters 1 and 3 is at the level of SMA is about 63 percent and the rest are elementary school graduates, and the network that is most widely used is Indosat and the number of suppliers is 1-3 and the number of customers is between 2-10 customers and the last gender is mostly male. The limitation of this research is that this research has only been conducted in 2 big markets in Jakarta, so later it can be carried out outside Jakarta, especially outside Java.

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